

IN THE CLAIMS

Claims 1-5 have been cancelled without prejudice.

6. (Currently Amended) In code division multiple access (CDMA) communication system, wherein packets of data are transmitted using a plurality of orthogonal code sequences and wherein each user of said code division multiple is allocated an orthogonal code sequence for communication on a traffic channel for transmitting variable rate packets of data symbols, an apparatus comprising:

a channel packetizer configured to receive for receiving said variable rate packets and, when a number of said data symbols included in ones of said variable rate packets exceeds a threshold value to split for splitting each of said ones of said variable rate packets into a traffic packet and at least one overflow packet;

a first modulator configured to receive for receiving said traffic packet and to modulate for modulating said traffic packet in accordance with said orthogonal code sequence of said plurality of orthogonal code sequences and to modulate for modulating said orthogonal modulated traffic packet in accordance with a first pseudorandom noise (PN) sequence;

a second modulator configured to receive for receiving said at least one overflow packet and to modulate for modulating said at least one overflow packet in accordance with an orthogonal code sequence of said plurality of orthogonal code sequences and to modulate for modulating said at least one orthogonal modulated overflow packet in accordance with at least one additional pseudorandom noise (PN) sequence wherein said at least one additional PN sequence is nonorthogonal to said first PN sequence; and

a transmitter configured to transmit for transmitting said traffic packet on said traffic channel and to transmit for transmitting at least one overflow packet on said at least one overflow channel.

7. (Previously added) The apparatus of Claim 6 wherein said channel packetizer is responsive to a rate signal.

8. (Currently Amended) The apparatus of Claim 6 further comprising a variable rate vocoder configured to receive ~~for receiving~~ speech samples and to compress ~~for compressing~~ said speech samples in accordance with a variable rate vocoder format to provide said variable rate packets.

9. (Currently Amended) The apparatus of Claim 8 further comprising an encoder configured to error correction code ~~for error correction coding~~ said variable rate packets.

10. (Currently Amended) The apparatus of Claim 9 further comprising an interleaver configured to reorder ~~for reordering~~ said variable rate packets, said encoder being disposed between said variable rate vocoder and said interleaver.

11. (Currently Amended) An apparatus for transmitting variable rate packets of data symbols comprising;

means for receiving said variable rate packets and for dividing each of said variable rate packets including more than a threshold number of said data symbols into a traffic packet and into an overflow packet, each said traffic packet being provided to a first packetizer output and each said overflow packet being provided to a second packetizer output;

means for receiving said traffic packet and for modulating said traffic packet in accordance with said an orthogonal code sequence of a plurality of orthogonal code sequences and having a first output for providing said orthogonal code sequence modulated traffic packet;

means for receiving said orthogonal code modulated traffic packet and for modulating said orthogonal code modulated traffic packet in accordance with a first PN sequence;

means for receiving said overflow packet and for modulating said overflow in accordance with a second orthogonal code sequence of said plurality of orthogonal code

sequences and having a second output for providing said orthogonal code modulated overflow packet;

means for receiving said orthogonal code modulated overflow packet and for modulating said orthogonal code modulated overflow packet in accordance with a second PN sequence which is non-orthogonal to said first PN sequence; and

a transmitter means having a first input coupled to said first modulator output and having a second input coupled to said second modulator output, said transmitter further having an output.

12. (Previously Added) The apparatus of Claim 11 wherein said channel packetizer is responsive to a rate signal.

13. (Previously Added) The apparatus of Claim 12 further comprising a variable rate vocoder for receiving speech samples and for compressing said speech samples in accordance with a variable rate vocoder format to provide said variable rate packets.

14. (Previously Added) The apparatus of Claim 13 further comprising an encoder for error correction coding said variable rate packets.

15. (Previously Added) The apparatus of Claim 14 further comprising an interleaver for reordering said variable rate packets, said encoder being disposed between said variable rate vocoder and said interleaver.

16. (Currently Amended) An apparatus for transmitting variable rate packets of data symbols comprising;

a channel packetizer having an input for receiving said variable rate packets and for dividing each of said variable rate packets including more than a threshold number of said data symbols into a traffic packet and into an overflow packet, each said traffic

packet being provided to a first packetizer output and each said overflow packet being provided to a second packetizer output;

a first modulator having an input for receiving said traffic packet and for modulating said traffic packet in accordance with said an orthogonal code sequence of a plurality of orthogonal code sequences and having a first output for providing said orthogonal code sequence modulated traffic packet;

a first PN modulator having an input for receiving said orthogonal code modulated traffic packet and for modulating said orthogonal code modulated traffic packet in accordance with a first PN sequence;

a second modulator having an input for receiving said second packet and for modulating said traffic packet in accordance with a second orthogonal code sequence of said plurality of orthogonal code sequences and having a second output for providing said orthogonal code modulated traffic packet;

a second PN modulator having an input for receiving said orthogonal code modulated overflow packet and for modulating said orthogonal code modulated overflow packet in accordance with a second PN sequence which is non-orthogonal to said first PN sequence; and

a transmitter having a first input coupled to said first modulator output and having a second input coupled to said second modulator output, said transmitter further having an output.

17. (Previously Added) The apparatus of Claim 16 wherein the first PN modulator and the second PN modulator is responsive to a rate signal.

18. (Previously Added) The apparatus of Claim 16 further comprising a receiver for receiving speech samples and a compressor for compressing said speech samples in accordance with a variable rate vocoder format to provide said variable rate packets.

19. (Previously Added) The apparatus of Claim 18 further comprising an error correction coder for coding said variable rate packets.

20. (Previously Added) The apparatus of Claim 16 further comprising an interleaver for interleaving said variable rate packets.

21. (Currently Amended) An apparatus for transmitting variable rate packets of data symbols comprising:

a channel packetizer having an input for receiving said variable rate packets and for dividing each of said variable rate packets including more than a threshold number of said data symbols into a traffic packet and into an overflow packet, each said traffic packet being provided to a first packetizer output and each said overflow packet being provided to a second packetizer output, said channel packetizer responsive to a rate signal;

a first modulator having an input for receiving said traffic packet and for modulating said traffic packet in accordance with said an orthogonal code sequence of a plurality of orthogonal code sequences and having a first output for providing said orthogonal code sequence modulated traffic packet;

a first PN modulator having an input for receiving said orthogonal code modulated traffic packet and for modulating said orthogonal code modulated traffic packet in accordance with a first PN sequence;

a second modulator having an input for receiving said overflow packet and for modulating said overflow packet in accordance with a second orthogonal code sequence of said plurality of orthogonal code sequences and having a second output for providing said orthogonal code modulated overflow packet;

a second PN modulator having an input for receiving said orthogonal code modulated overflow packet and for modulating said orthogonal code modulated overflow packet in accordance with a second PN sequence which is non-orthogonal to said first PN sequence; and

a transmitter having a first input coupled to said first modulator output and having a second input coupled to said second modulator output, said transmitter further having an output.

22. (Previously Added) The apparatus of Claim 21 further comprising a variable rate vocoder for receiving speech samples and for compressing said speech samples in accordance with a variable rate vocoder format to provide said variable rate packets.

23. (Previously Added) The apparatus of Claim 22 further comprising an encoder for error correction coding said variable rate packets.

24. (Previously Added) The apparatus of Claim 23 further comprising an interleaver for reordering said variable rate packets, said encoder being disposed between said variable rate vocoder and said interleaver.

25. (Currently Amended) In a system in which variable rate packets of data symbols including in excess of a threshold number of said data symbols are each transmitted as a traffic packet and an overflow packet, an apparatus for receiving said variable rate packets of data symbols comprising:

a traffic demodulator configured to demodulate for demodulating said traffic packet received by said apparatus using a first pseudonoise (PN) sequence and a sequence of a first set of orthogonal sequences to provide a demodulated traffic packet;

an overflow demodulator configured to demodulate for demodulating said overflow packet received by said apparatus using a second pseudonoise (PN) sequence and a second sequence of said first set of orthogonal sequences to provide a demodulated overflow packet; said overflow demodulator ~~means~~ dynamically allocated based on whether said variable rate packets of data symbols exceed a threshold number of said data symbols, wherein said first PN sequence is temporally offset and non-orthogonal to said second PN sequence; and

a combiner configured to combine ~~for combining~~ said demodulated traffic packet and said demodulated overflow packet to provide said variable rate packets.

26. (Currently Amended) The apparatus of Claim 25, wherein said traffic demodulator further comprises:

an orthogonal traffic sequence generator configured to generate ~~for generating~~ a traffic sequence; and

an orthogonal traffic despreader configured to receive ~~for receiving~~ said demodulated traffic packet and to despread despread said demodulated traffic packet using said traffic sequence,

wherein said overflow demodulator further comprises:

an orthogonal overflow sequence generator configured to generate ~~for generating~~ an overflow sequence; and

an orthogonal overflow despreader configured to receive ~~for receiving~~ said demodulated overflow packet and to despread despread said demodulated overflow packet using said overflow sequence.

27. (Previously Added) The apparatus of Claim 25, wherein said combiner continuously monitoring said traffic demodulator and said overflow demodulator.

28. (Previously Added) The apparatus of Claim 25, wherein said combiner monitors said overflow demodulator only when instructed by said traffic demodulator.

29. (New) An apparatus for transmitting variable rate packets of data symbols comprising:

a channel packetizer configured to receive said variable rate packets and, when a number of said data symbols included in ones of said variable rate packets exceeds a threshold value to split each of said ones of said variable rate packets into a traffic packet and at least one overflow packet;

a first modulator configured to receive said traffic packet and to modulate said traffic packet in accordance with a first code sequence; and

a second modulator configured to receive said at least one overflow packet and to modulate said at least one overflow packet in accordance with a second code sequence that is orthogonal to the first code sequences if usage of orthogonal code sequences is low, and otherwise to modulate said at least one overflow packet in accordance with a code sequence that is not orthogonal to the first code sequences.

30. (New) The apparatus of claim 29, wherein the first modulator is further configured to modulate said code sequence modulated traffic packet in accordance with a first pseudorandom noise (PN) sequence; and wherein the second modulator is further configured to modulate said at least one code sequence modulated overflow packet in accordance with at least one additional PN sequence wherein said at least one additional PN sequence is nonorthogonal to said first PN sequence.

89

31. (New) The apparatus of claim 30, further comprising:
a transmitter configured to transmit said traffic packet on a traffic channel and to transmit at least one overflow packet on at least one overflow channel.

32. (New) The apparatus of Claim 29 further comprising a variable rate vocoder configured to receive speech samples and to compress said speech samples in accordance with a variable rate vocoder format to provide said variable rate packets.

33. (New) The apparatus of Claim 32 further comprising an encoder configured to error correction code said variable rate packets.

34. (New) The apparatus of Claim 33 further comprising an interleaver configured to reorder said variable rate packets, said encoder being disposed between said variable rate vocoder and said interleaver.

35. (New) A method for transmitting variable rate packets of data symbols comprising:

receiving said variable rate packets;

splitting ones of said variable rate packets into a traffic packet and at least one overflow packet when a number of said data symbols included in ones of said variable rate packets exceeds a threshold value;

modulating said traffic packet in accordance with a first code sequence; and

modulating said at least one overflow packet in accordance with a second code sequence that is orthogonal to the first code sequence if usage of orthogonal code sequences is low, and otherwise modulating said at least one overflow packet in accordance with a second code sequence that is not orthogonal to the first code sequence.

36. (New) The method of claim 35, further comprising:

modulating said code sequence modulated traffic packet in accordance with a first pseudorandom noise (PN) sequence;

modulating said at least one code sequence modulated overflow packet in accordance with at least one additional PN sequence wherein said at least one additional PN sequence is nonorthogonal to said first PN sequence; and

transmitting said traffic packet on a traffic channel and transmitting at least one overflow packet on at least one overflow channel.

37. (New) The method of Claim 35 further comprising:

receiving speech samples; and

compressing said speech samples in accordance with a variable rate vocoder format to provide said variable rate packets.

38. (New) The method of Claim 35 further comprising error correction coding said variable rate packets.

39. (New) An apparatus for transmitting variable rate packets of data symbols comprising:

means for receiving said variable rate packets;

means for splitting ones of said variable rate packets into a traffic packet and at least one overflow packet when a number of said data symbols included in ones of said variable rate packets exceeds a threshold value;

means for modulating said traffic packet in accordance with a first code sequence; and

means for modulating said at least one overflow packet in accordance with a second code sequence that is orthogonal to the first code sequence if usage of orthogonal code sequences is low, and otherwise for modulating said at least one overflow packet in accordance with a second code sequence that is not orthogonal to the first code sequence.

40. (New) The apparatus of claim 39, further comprising:

means for modulating said code sequence modulated traffic packet in accordance with a first pseudorandom noise (PN) sequence;

means for modulating said at least one code sequence modulated overflow packet in accordance with at least one additional PN sequence wherein said at least one additional PN sequence is nonorthogonal to said first PN sequence; and

means for transmitting said traffic packet on a traffic channel and for transmitting at least one overflow packet on at least one overflow channel.

41. (New) The apparatus of Claim 39 further comprising:

means for receiving speech samples; and

means for compressing said speech samples in accordance with a variable rate vocoder format to provide said variable rate packets.

42. (New) The apparatus of Claim 39 further comprising means for error correction coding said variable rate packets.

43. (New) An apparatus for receiving variable rate packets of data symbols transmitted as a traffic packet and an overflow packet, comprising:

a traffic demodulator configured to demodulate said traffic packet using a first code sequence; and

an overflow demodulator configured to demodulate said overflow packet using a second code sequence that is orthogonal to the first code sequence if usage of orthogonal code sequences is low, and otherwise to modulate said overflow packet using a second code sequence that is not orthogonal to the first code sequence.

44. (New) The apparatus of claim 43, wherein said traffic demodulator is further configured to demodulate said traffic packet using a first pseudonoise (PN) sequence to provide a demodulated traffic packet; and wherein said overflow demodulator is further configured to demodulate said overflow packet using a second pseudonoise (PN) sequence to provide a demodulated overflow packet; wherein said first PN sequence is temporally offset and non-orthogonal to said second PN sequence.

45. (New) The apparatus of claim 44, further comprising:

a combiner configured to combine said demodulated traffic packet and said demodulated overflow packet to provide said variable rate packets.

46. (New) The apparatus of claim 43, wherein said overflow demodulator is dynamically allocated based on whether said variable rate packets of data symbols exceed a threshold number of said data symbols.

47. (New) A method for receiving variable rate packets of data symbols transmitted as a traffic packet and an overflow packet, comprising:

demodulating said traffic packet using a first code sequence; and

demodulating said overflow packet using a second code sequence that is orthogonal to the first code sequence if usage of orthogonal code sequences is low, and

otherwise to modulating said overflow packet using a second code sequence that is not orthogonal to the first code sequence.

48. (New) The method of claim 47, further comprising:
demodulating said traffic packet using a first pseudonoise (PN) sequence to provide a demodulated traffic packet;
demodulating said overflow packet using a second pseudonoise (PN) sequence to provide a demodulated overflow packet; wherein said first PN sequence is temporally offset and non-orthogonal to said second PN sequence; and
combining said demodulated traffic packet and said demodulated overflow packet to provide said variable rate packets.

49. (New) An apparatus for receiving variable rate packets of data symbols transmitted as a traffic packet and an overflow packet, comprising:
means for demodulating said traffic packet using a first code sequence; and
means for demodulating said overflow packet using a second code sequence that is orthogonal to the first code sequence if usage of orthogonal code sequences is low, and otherwise for modulating said overflow packet using a second code sequence that is not orthogonal to the first code sequence.

50. (New) The apparatus of claim 49, further comprising:
means for demodulating said traffic packet using a first pseudonoise (PN) sequence to provide a demodulated traffic packet;
means for demodulating said overflow packet using a second pseudonoise (PN) sequence to provide a demodulated overflow packet; wherein said first PN sequence is temporally offset and non-orthogonal to said second PN sequence; and
means for combining said demodulated traffic packet and said demodulated overflow packet to provide said variable rate packets.